

CLAIMS

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1. A method comprising:  
receiving an original digital good; and  
randomly applying various forms of protection to the original digital good  
to produce a protected digital good.

2. A method as recited in claim 1, wherein the randomly applying  
comprises pseudo randomly applying the various forms of protection according to  
pseudo random techniques.

3. A method as recited in claim 1, wherein the applying comprises  
randomly selecting the forms of protection from a set of available forms of  
protection.

4. A method as recited in claim 1, wherein the applying comprises  
applying the various forms of protection to randomly selected portions of the  
original digital good.

1           5. A method as recited in claim 1, wherein the various forms of  
2 protection are selected from a group of protection tools comprising code integrity  
3 verification, acyclic code integrity verification, cyclic code integrity verification,  
4 secret key scattering, obfuscated function execution, encryption/decryption,  
5 probabilistic checking, Boolean check obfuscation, in-lining, reseeding pseudo  
6 random number generators with time varying inputs, anti-disassembly methods,  
7 varying execution paths between runs, anti-debugging methods, and time/space  
8 separation between tamper detection and response.

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10           6. A method as recited in claim 1, wherein the applying comprises  
11 applying a form of protection in which a checksum can be computed on a set of  
12 bytes of the digital good without actually reading the bytes.

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14           7. A computer-readable medium comprising computer-readable  
15 instructions that, when executed by a processor, direct a computer system to  
16 perform the method as recited in claim 1.

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18           8. A method comprising:  
19           segmenting a digital good into a plurality of segments;  
20           selecting multiple segments from the plurality of segments; and  
21           transforming the selected segments according to different protection  
22 techniques to produce a protected digital good having a composite of variously  
23 protected segments.

1           9.    A method as recited in claim 8, wherein at least two of the segments  
2 overlap one another.

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4           10.   A method as recited in claim 8, wherein the selecting comprises  
5 randomly selecting the segments.

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7           11.   A method as recited in claim 8, wherein the transforming comprises  
8 transforming the selected segments according to randomly chosen protection  
9 techniques.

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11           12.   A method as recited in claim 8, wherein the transforming comprises:  
12 augmenting at least one segment using a certain protection technique; and  
13 inserting a checkpoint, which may be used to evaluate a validity of the  
14 augmented segment, within the protected digital good but outside of the  
15 augmented segment being evaluated.

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17           13.   A method as recited in claim 8, further comprising receiving  
18 quantitative parameters indicative of how much the protected digital good should  
19 be altered.

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21           14.   A method as recited in claim 13, wherein the transforming is  
22 performed to satisfy the quantitative parameters.

1        15. A method as recited in claim 8, wherein the protection techniques  
2 are selected from a group of protection tools comprising code integrity  
3 verification, acyclic code integrity verification, cyclic code integrity verification,  
4 secret key scattering, obfuscated function execution, encryption/decryption,  
5 probabilistic checking, Boolean check obfuscation, in-lining, reseeding pseudo  
6 random number generators with time varying inputs, anti-disassembly methods,  
7 varying execution paths between runs, anti-debugging methods, and time/space  
8 separation between tamper detection and response.

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10       16. A method as recited in claim 8, wherein the transforming comprises  
11 applying a protection technique in which a checksum can be computed on a set of  
12 bytes of the digital good without actually reading the bytes.

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14       17. A computer-readable medium comprising computer-readable  
15 instructions that, when executed by a processor, direct a computer system to  
16 perform the method as recited in claim 8.

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18       18. A method comprising:  
19       establishing parameters prescribing a desired quantity of protection to be  
20 applied to a software product;  
21       parsing the software product into code sections;  
22       selecting at least one code section;  
23       augmenting the selected code section to add protection qualities; and  
24       repeating the selecting and the augmenting for different code sections until  
25 the desired quantity of protection has been applied.

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2       **19.**    A method as recited in claim 18, wherein the establishing comprises  
3 enabling a user to enter the parameters.

4  
5       **20.**    A method as recited in claim 18, wherein the augmenting comprises  
6 applying a protection technique selected from a group of protection techniques  
7 comprising code integrity verification, acyclic code integrity verification, cyclic  
8 code integrity verification, secret key scattering, obfuscated function execution,  
9 encryption/decryption, probabilistic checking, Boolean check obfuscation, in-  
10 lining, reseeding pseudo random number generators with time varying inputs, anti-  
11 disassembly methods, varying execution paths between runs, anti-debugging  
12 methods, and time/space separation between tamper detection and response.

13  
14       **21.**    A method as recited in claim 18, wherein the augmenting comprises  
15 applying a protection technique in which a checksum can be computed on a set of  
16 bytes of the digital good without actually reading the bytes.

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18       **22.**    A computer-readable medium comprising computer-readable  
19 instructions that, when executed by a processor, direct a computer system to  
20 perform the method as recited in claim 18.

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22       **23.**    A production system, comprising:  
23       a memory to store an original digital good; and  
24       a production server equipped with a set of multiple protection tools that  
25 may be used to augment the original digital good for protection purposes, the

1 production server being configured to parse the original digital good and apply  
2 protection tools selected from the set of protection tools to various portions of the  
3 original digital good in a random manner to produce a protected digital good  
4 having a composite of variously protected portions.  
5

6 **24.** A production system as recited in claim 23, wherein the protection  
7 tools are selected from a group of protection tools comprising code integrity  
8 verification, acyclic code integrity verification, cyclic code integrity verification,  
9 secret key scattering, obfuscated function execution, encryption/decryption,  
10 probabilistic checking, Boolean check obfuscation, in-lining, reseeding pseudo  
11 random number generators with time varying inputs, anti-disassembly methods,  
12 varying execution paths between runs, anti-debugging methods, and time/space  
13 separation between tamper detection and response.  
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15 **25.** A production system as recited in claim 23, wherein the production  
16 server applies a protection tool that enables a checksum to be computed on a set of  
17 bytes of the digital good without actually reading the bytes.  
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19 **26.** A production system as recited in claim 23, wherein the production  
20 server has a pseudo random generator to introduce randomness into the application  
21 of the protection tools to various portions of the original digital good.  
22

23 **27.** An obfuscation system, comprising:  
24 a parser to parse a digital good into a plurality of segments;  
25

1 a set of protection tools that may be applied to the segments of the digital  
2 good to augment the segments with protection qualities;

3 a target segment selector to select at least one segment from the plurality of  
4 segments; and

5 a tool selector to select at least one protection tool from the set of protection  
6 tools and apply the selected protection tool to the selected segment.

7  
8 **28.** An obfuscation system as recited in claim 27, wherein the protection  
9 tools are selected from a group of protection tools comprising code integrity  
10 verification, acyclic code integrity verification, cyclic code integrity verification,  
11 secret key scattering, obfuscated function execution, encryption/decryption,  
12 probabilistic checking, Boolean check obfuscation, in-lining, reseeding pseudo  
13 random number generators with time varying inputs, anti-disassembly methods,  
14 varying execution paths between runs, anti-debugging methods, and time/space  
15 separation between tamper detection and response.

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17 **29.** An obfuscation system as recited in claim 27, wherein the target  
18 segment selector comprises a pseudo random generator to enable random selection  
19 of the segment.

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21 **30.** An obfuscation system as recited in claim 27, wherein the tool  
22 selector comprises a pseudo random generator to enable random selection of the  
23 protection tool.  
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1       **31.**    An obfuscation system as recited in claim 27, further comprising a  
2 quantitative unit to specify a quantity of protection qualities to be added to the  
3 digital good.

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5       **32.**    A client-server system, comprising:  
6       a production server to randomly apply various forms of protection to a  
7 digital good to produce a protected digital good; and  
8       a client to store and execute the protected digital good, the client being  
9 configured to evaluate the protected digital good to determine whether the  
10 protected digital good has been tampered with.

11  
12       **33.**    One or more computer-readable media having computer-executable  
13 instructions that, when executed, direct a computing device to:  
14       parse a digital good into a plurality of segments; and  
15       apply multiple different protection tools to various segments in a random  
16 manner to produce a protected digital good having a composite of variously  
17 protected portions.

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19       **34.**    One or more computer-readable media as recited in claim 33, further  
20 comprising computer-executable instructions to randomly select the protection  
21 tools from a set of available protection tools.



1        35.    One or more computer-readable media as recited in claim 33,  
2 further comprising computer-executable instructions to apply the protection tools  
3 to randomly selected portions of the original digital good.

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5        36.    One or more computer-readable media as recited in claim 33,  
6 wherein the protection tools are selected from a group of protection tools  
7 comprising code integrity verification, acyclic code integrity verification, cyclic  
8 code integrity verification, secret key scattering, obfuscated function execution,  
9 encryption/decryption, probabilistic checking, Boolean check obfuscation, in-  
10 lining, reseeding pseudo random number generators with time varying inputs, anti-  
11 disassembly methods, varying execution paths between runs, anti-debugging  
12 methods, and time/space separation between tamper detection and response.